**Exploring the Ratio of Dumbbell Press to Flat Bench Press**

**Many weightlifters wish to track the ratio between the weight they use for flat dumbbell press compared to barbell bench press.**

A **dumbbell** is a short bar with equal weight on both sides designed to be held in the lifter's hands. Flat dumbbell press is when the lifter lies on a flat bench with their arms positioned at roughly 45-degree angles, lifts two equal sized dumbbells, brings them back to the chest, and then keeps going.

A **barbell** is similar in shape to a dumbbell, but is a longer, much heavier bar where multiple weighted plates can be placed on either side. Barbell bench press is when the lifter lies on a bench with the barbell positioned at their chest, lifts the barbell, and then brings it back down.

**The goal of the ratio is to compare how much someone is lifting two dumbbells versus how much they are able to lift the weighted barbell. You obtain the ratio by multiplying the weight of one dumbbell by 2 (to account for the two weights that the person would hold) and dividing that weight by the amount someone is able to barbell bench press.**

**The data is sourced from a self-reported Reddit open forum[[1]](#footnote-1). Users provided their weight for both a flat dumbbell press and a barbell bench press, and it was compiled by another user into the corresponding weight ratio. It is important to note that as this is a self-reported open forum, biases may be introduced that wouldn't otherwise be present.**

A screenshot of a calculator

Description automatically generatedBelow is a dataset with observations from 18 weightlifters and their corresponding ratio, as well as summary statistics and visualizations for the data.

**A graph with a bar

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A screenshot of a cell phone

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**A graph with blue lines

Description automatically generated1.** The graph to the right shows a histogram of the collected data. Based on the histogram and the data table, what could be a concern regarding the spread of the data, and what is a possible solution.

**2.** What potential problems could arise from the way the data was collected?

**3.** Find the interquartile range (IQR) for the 18 weightlifters.

**4.** Based on the IQR and using the “1.5 IQR Rule,” are there any discernable outliers in this dataset?

**5.** Create a 95% confidence interval for the mean ratio between flat dumbbell press and barbell bench press.

**6.** Say a weightlifter has a ratio of 0.45 and has a goal to become more “balanced” in order to fall within the confidence interval found in the previous question. What should the lifter do in order to achieve this? Explain both in terms of the ratio and the exercises involved.

**7.**  Considering your answer in question 2, do you believe that the population mean presented in this confidence interval is reliable? What audience would it apply to? Explain your answer.

**8.** Why would a hypothesis test not be appropriate given the data that we currently have?

1. Reddit Thread: <https://www.reddit.com/r/Fitness/comments/35q4i3/how_much_do_you_dumbbell_flat_bench_compared_to/> [↑](#footnote-ref-1)